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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,067	11/05/2003	John Mark Torkelson	6313.190A	6310

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EXAMINER

RONESI, VICKEY M

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 05/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/701,067

Applicant(s)

TORKELSON ET AL.

Examiner

Vickey Ronesi

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8 and 18-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. All outstanding objections and rejections are withdrawn, except for those provided below, in light of applicant's amendment filed 4/21/2006.
2. The petition filed 2/21/2006 to accept an unintentionally delayed claim under 35 USC 119(e) for the benefit of a prior filed provisional application has been granted. Hence, the intervening references (namely, "PMSE Preprint" and "ACS National Meeting Abstract") are no longer be applied as prior art.
3. Upon an updated search, new art was uncovered and has been used in prior art rejections. New grounds of rejection are set forth below. Thus, *a 2nd non-final Office action is set forth as follows.*

Claim Rejections - 35 USC § 112

54. Claims 18 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "nonpolar polymer" is considered to be indefinite since it is not made clear what the term "nonpolar" is intended to encompass. While applicant exemplifies polyolefins as being nonpolar polymers, other polymers are also nonpolar but not included in the list such as polystyrene.

Claim Rejections - 35 USC § 103

5. Claims 1, 3-8, and 19-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmer et al (US 2002/0165306) alone or in view of Winckler et al (US 6,420,047).

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.

Gilmer et al discloses a polymer/clay nanocomposite containing polyamides such as nylon (paragraph 0085) and up to 15 wt % clay (paragraph 0089) such as montmorillonite (paragraphs 0091-0092) which is intercalated with organic cations (paragraph 0102), wherein the nanocomposite is made by mixing the polymer with the clay in a melt extruder, grinding the mixture, and then extruding again to form the nanocomposite (Example 20, paragraph 00145).

While Gilmer et al does not explicitly teach a step of cooling while grinding (i.e., pulverizing), given that a process of grinding polymer requires the polymer to be in the solid state, it is intrinsic that there is present a cooling sufficient to maintain the mixture in the solid state. Further evidence to support the examiner's position is found in Winckler et al which teaches that polyamide is not easy to grind at ambient temperature and needs to be cooled or frozen in order to be ground (col. 29, lines 29-33).

Given that polyamide needs to be cooled in order to be ground as taught by Winckler, it would have been obvious to one of ordinary skill in the art to maintain the polypropylene of Gilmer et al in a solid state by cooling (including to a temperature of 10°C) while grinding.

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6. Claims 1, 3, 4, 6-8, 18-21, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bishop et al (US 6,500,892) alone or in view of Winckler et al (US 6,420,047).

Bishop et al discloses a method of forming a polypropylene/clay nanocomposite which contains up to 25 wt % clay (col. 5, lines 14-20) comprising the steps of mixing a polypropylene and intercalated clay in a Banbury mixer, cooling, grinding, drying, and then extruding to obtain the nanocomposite (Example 4). The clay is in the smectite class (i.e., montmorillonite) (col. 4, lines 13-23; col. 1, line 28).

Bishop et al does not explicitly teach a step of cooling while grinding (i.e., pulverizing), however, given that a process of grinding polymer requires the polymer to be in the solid state, it is intrinsic that there is present a cooling sufficient to maintain the mixture in the solid state. Further evidence to support the examiner's position is found in Winckler et al which teaches that polypropylene is not easy to grind at ambient temperature and needs to be cooled or frozen in order to be ground (col. 29, lines 29-33).

Given that polypropylene needs to be cooled in order to be ground as taught by Winckler, it would have been obvious to one of ordinary skill in the art to maintain the polypropylene of Bishop et al in a solid state by cooling (including to a temperature of 10°C) while grinding.

Response to Arguments

7. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Ronesi whose telephone number is (571) 272-2701. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

4/28/2006
Vickey Ronesi

Vasu Jagannathan
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